

A FLORISTIC PROFILE OF THE McDONOUGH COUNTY,  
ILLINOIS, SPONTANEOUS VASCULAR FLORA

R. D. Henry

R. M. Myers Herbarium and Institute for Environmental Management  
Western Illinois University, Macomb 61455

ABSTRACT

A floristic profile of the current spontaneous vascular flora of a west-central Illinois county, McDonough, is presented. Dr. R. M. Myers initiated floristic studies of the McDonough County vascular flora in 1945. Presently there are 1096 species in the County's spontaneous vascular flora which represents about 40% of the Illinois spontaneous vascular flora. Twenty-four percent of these species are alien, 82% of which came from the old world. Nearly 60% of the alien species have been cultivated, probably about 82% naturalized and about 4.7 species introduced yearly since 1948. The 1096 species are in five divisions (2.6% pteridophytes, 0.3% gymnosperms, 97.1% angiosperms), 114 families and 477 genera; they are about 14% woody, 24% annuals, 4% biennials, 72% perennials, 6% obligate aquatics, 28% weeds, 18% poisonous to humans, 6% poisonous to livestock and 16% drug plants. There are seven Illinois threatened and endangered species of which probably only three are extant. In the County there are four areas listed by the Illinois Natural Areas Inventory and no Illinois Nature Preserves.

INTRODUCTION

McDonough County is located in west-central Illinois, has an elevation ranging from 500 to 775 feet above sea level (averaging 690 feet), is drained principally through the Lamoine River system, is covered mostly with glacial drift from 10 to 140 feet thick with much of the northern part covered with loess up to 50 feet thick, has three main types of soil (dark upland prairie, swamp and bottomland, lighter upland timber), has an average rainfall of 34.76 inches and has an area of 576 square miles (Myers and Wright 1948) of which about 94% is under cultivation (Shadwick 1968 p. 118).

Floristic studies of the McDonough County vascular flora were initiated by Dr. R. M. Myers upon his arrival in the Department of Biological Sciences at Western Illinois University in 1945 and were continued vigorously by him until his retirement as professor and herbarium curator in 1977. He stated (Myers 1972 p. 58) that "There are no reports for collections in the County before 1945"

although in an undated (but probably written near the mid 1960's) grant proposal for research on the County flora he stated in the introduction "Previous to 1945 the flora of McDonough had not been studied and only four species of plants had been collected according to the literature." He writes in this same proposal when he came there was no herbarium or facilities for collecting or storing specimens; he then proceeded to obtain some collecting materials, a herbarium case and started a project to collect all the vascular plants (with duplicate specimens being deposited in the Illinois State Museum at Springfield) in the County noting that a herbarium (which he states (Myers 1972 p. 59) was founded in 1946) besides being essential for teaching classes in Plant Taxonomy, Ecology, related fields and research, "also provides a record of the flora which is subject to change due to the destruction of woodlands, draining of swamps, construction of buildings and intensive farming."

In 1946 Dr. Myers, on a typed catalog he prepared of the vascular plants of Illinois as listed in Jones' (1945) Flora of Illinois, annotated the McDonough County species. He listed 187 species (I counted 190) by June 30, 1946. Since there were also some dated after that in 1946, I counted a total of 217 species on his list. Ten of these he noted as cultivated thus resulting in 177 and 207 species respectively as being spontaneous. It appears that nearly all of these observations and collections were made in 1946 within a several mile radius of Macomb including many in the W.I.U. campus vicinity and some at Spring Lake Park. Myers produced mimeographed catalogs (checklists) in 1948 (reproduced as Myers (1983)), 1959, and 1964 in which he listed 522, 745 and 837 species respectively. In 1972 (Myers 1972) he annotated 944 species noting that 919 of these were native and naturalized alien taxa and excluded another 22 (I counted 25) as not naturalized aliens. In this publication he provided a discussion of the County flora (pp. 55-59) and the W.I.U. Herbarium (p. 59). Other annotations of the species included if specimens collected in McDonough County were in the W.I.U. herbarium or not, rare, alien, economic plant, ornamental, poisonous, weed, aquatic and, if not numbered, not naturalized. In 1975 (Myers 1975) he published 15 new County records stating that "The addition of these species increases the known vascular plants growing wild in McDonough County to 947, but 27 are excluded as they are alien ornamentals or economic plants considered to be casual escapes from cultivation, anthropogenetic relicts or railroad migrants." Henry and Scott in 1982 (Henry and Scott 1982) listed 1061 species (as well as an additional 34 subspecific and hybrid taxa) as growing spontaneously in the County. In 1986 the Illinois Natural History Survey (Illinois Natural History Survey 1986) indicated there are between 901 and 1100 species in the County. This paper is based upon 1096 vascular plant species (plus an additional 48 infraspecific taxa and seven hybrids) that have been recorded as occurring spontaneously (growing without having been intentionally planted by man and thus includes all native and

non-planted aliens whether naturalized or not) in the McDonough County flora and which serve as the basis for this floristic profile.

Most of McDonough County is in the transitional zone between the Grand Prairie and Forest-Prairie Transition floristic provinces of Illinois, the former province occurring at the northeastern edge and the latter province occurring at the southern edge of the County (Anderson and Ugent 1980). The Natural Division of Illinois which includes McDonough County is the Western Forest-Prairie Division (specifically the Galesburg section) according to Schwegman (1973). A map of Illinois published in 1982 (Illinois Department of Conservation 1982) titled The Forests of Illinois, depicts the forest cover of McDonough County from the time of settlement (1810) until recently as well as the general forest types, acreage and coverage. Myers and Wright (1948) published a paper on the vegetation of McDonough County showing that generally the original vegetation was prairie in the northeast one-half and forest in the southwest one-half of the County. The natural vegetation has also been generally summarized by Shadwick (1968 p. 9-11). In general, the forest coverage of the County has been reduced from about 45% to around 8% and the prairie from 55% to practically none today.

Some other publications concerning the McDonough County flora that are not otherwise cited in this paper are: Mavis and Mavis (1972 on wildflowers; text supplemented by Kodachrome transparencies, a set of which was given to the Illinois State Museum (Springfield) and to the W.I.U. library), Myers (1950 on *Marsilea*), Henry and Scott (1984 on seeps), Henry and Scott (1985 on Ferster Woods), Henry (1965 on lawnplants), Laughberaugh (1856 on original land survey), Henry, Ives, O'Flaherty and Stidd (1978 and partially revised 1986 for keys to common plants), Thurow and Henry (1968 on chestnut trees), Myers (1982 reprint of 1975 mimeograph on a tall grass prairie west of Macomb), Coon, Guilinger and Martin (1984 reprint of a 1964 report of a wet prairie remnant), Morris (1961 on trees), and Schwegman (1982 on *Leptochloa uninervia*). Relevant W.I.U. master degree theses are Murphy (1951 on a phytosociological study of an oak-hickory woods), Seely (1949 on poisonous plants), Neal (1969 floristics of Lake Vermont), Reese (1979 on the railroad flora) and currently in process a floristic study of Macomb's Spring Lake Park area by C. Wirmum. In the W.I.U. herbarium library are some student class reports and term papers that contain useful information on some areas. Some publications that deal with County records and distributional information that include McDonough County are Mohlenbrock and Ladd (1978), Jones and Fuller (1955), Winterringer and Evers (1960), Henry, Scott and Shildneck (1978), Henry and Scott (1983), Scott and Henry (1982), Scott and Henry (1979), Ladd and Mohlenbrock (1983), Mohlenbrock (1985) and Henry and Scott (1986).

This floristic profile is based upon an updated copy of "Check-list of the Vascular Plants of McDonough County, Illinois" (Henry and Scott 1982) which is summarized in Table 1. Taxa nomenclature at and below the family level, as well as taxa numbers in Illinois used in this paper follow Mohlenbrock (1975) rather than Mohlenbrock (1986) which was published after the bulk of the data in this paper was prepared.

#### TAXONOMIC ANALYSIS

There are 1096 species in the McDonough County, Illinois, spontaneous vascular plant flora. This represents 40.2% of the present-day species in the spontaneous Illinois vascular plant flora (based on Mohlenbrock 1975). Of these species 269 (24.5%) are alien and 827 (75.5%) native species. In addition to the 1096 species there are 48 infraspecific taxa and 7 hybrids which represent 18.1% and 8.4% respectively of those in the present day Illinois flora based on Mohlenbrock (1975).

The 1096 species occur in all 5 vascular plant divisions that occur in Illinois. One (0.1%) is a *Lycopodiophyta*, 3 (0.3%) are *Equisetophyta*, 24 (2.2%) are *Polypodiophyta*, 4 (0.3%) are *Pinophyta* and 1064 (97.1%) are *Magnoliophyta*. Thus the species are about 2.6% pteridophytes, 0.3% gymnosperms and 97.1% angiosperms. Within the angiosperms 286 (26.9%) are *Liliopsida* (monocots) and 778 (73.1%) are *Magnoliopsida* (dicots). The monocots represent 26.1% and the dicots 71% of the 1096 species in this flora.

The 1096 species occur in 114 families. This represents 73.5% of the families in the spontaneous Illinois vascular plant flora based on Mohlenbrock (1975). One (0.9%) belongs to the *Lycopodiophyta*, one (0.9%) is an *Equisetophyta*, four (3.5%) are *Polypodiophyta*, three (2.6%) are *Pinophyta* and 105 (92.1%) are *Magnoliophyta*. Thus the families are about 5.3% pteridophytes, 2.6% gymnosperms, and 92.1% angiosperms. Within the angiosperms 18 (17.1%) are *Liliopsida* and 87 (82.9%) are *Magnoliopsida*. The monocots represent 15.8% and the dicots 76.3% of the 114 families in this flora. The five largest families are the *Compositae* (with 144 species), *Poaceae* (126 species), *Cyperaceae* (85 species), *Leguminosae* (48 species), and *Rosaceae* (47 species).

The 1096 species occur in 477 genera. This represents 57.5% of the genera in the spontaneous Illinois vascular plant flora based on Mohlenbrock (1975). One (0.2%) belongs to the *Lycopodiophyta*, one (0.2%) is a *Equisetophyta*, 14 (2.9%) are *Polypodiophyta*, three (0.7%) are *Pinophyta* and 458 (96%) are *Magnoliophyta*. Thus the genera are about 3.3% pteridophytes, 0.7% gymnosperms and 96% angiosperms. Within the angiosperms 105 (22.9%) are *Liliopsida* and 353 (77.1%) are *Magnoliopsida*. The monocots represent 22% and the dicots 74% of the 477 genera in this flora. The five largest

TABLE 1. SUMMARY OF McDONOUGH COUNTY, ILLINOIS, FLORISTIC DATA

A. Taxa Data								
	Total	Lycopodiophyta	Equisetophyta	Polypodiophyta	Pinophyta	Magnoliophyta		
						Total	Liliopsida	Magnoliopsida
Families	114	1	1	4	3	105	18	87
Genera	477	1	1	14	3	458	105	353
Species	1096	1	3	24	4	1064	286	778
Infra-specific taxa	48	0	0	1	0	47	12	35
Hybrids	7	0	0	1	0	6	2	4
Aliens	269	0	0	1	3	265	56	209

  

B. Other Data						
	Total	Lycopodiophyta	Equisetophyta	Polypodiophyta	Pinophyta	Magnoliophyta
Woody	148	0	0	0	4	144
Tree	82	0	0	0	4	78
Shrub	53	0	0	0	0	53
Vine	13	0	0	0	0	13
Duration						
Annual	261	0	0	0	0	261
Biennial	40	0	0	0	0	40
Perennial	795	1	3	24	4	763
Poisonous						
Human	197	0	0	0	1	196
Livestock	60	0	3	1	0	56
Drug	178	0	1	2	2	173
Aquatic	61	0	0	1	0	60
Native	827	1	3	23	1	799
Threatened	2	0	0	0	0	2
Endangered	5	0	0	1	0	4
Weed	310	0	3	1	3	303
Aliens	269	0	0	1	3	265
Aquatic	4	0	0	1	0	3
Origin						
Old World	221	0	0	1	0	220
Tropics	17	0	0	0	0	17
United States	31	0	0	0	3	28
east/north	3	0	0	0	2	1
south	2	0	0	0	1	1
west	26	0	0	0	0	26
Duration						
annual	128	0	0	0	0	128
biennial	23	0	0	0	0	23
perennial	118	0	0	1	3	114
Cultivated	159	0	0	1	3	155
Woody	32	0	0	0	3	29
Weed	123	0	0	0	2	121

genera are *Carex* (with 61 species), *Polygonum* and *Aster* (18 species each), *Panicum* (13 species), *Solidago* (12 species) and *Viola* (11 species).

Of the 48 infraspecific taxa, one (2.1%) is *Polypodiophyta* and 47 (97.9%) are *Magnoliophyta* of which 12 (25.5%) are *Liliopsida* and 35 (74.5%) are *Magnoliopsida*. Of the 7 hybrids one (14.3%) is a *Polypodiophyta* and six (85.7%) are *Magnoliophyta* of which two (33.3%) are *Liliopsida* and four (66.7%) are *Magnoliopsida*.

#### WOODY VS. HERBACEOUS SPECIES

Of the 1096 species 148 (13.5%) are woody and 948 (86.5%) are herbaceous. Of the 148 woody species 82 (55.4%) are trees, 53 (35.8%) are shrubs and 13 (8.8%) are vines. All of the pteridophytes are herbaceous, all of the gymnosperms woody (4 species, all trees, which represent 2.7% of the 148 woody species) and in the angiosperms 144 are woody which represents 97.3% of the 148 woody species and 13.5% of the 1064 angiosperm species. Of the 144 woody angiosperm species 78 (54.2%) are trees, 53 (36.8%) are shrubs and 13 (9.0%) are vines. There are 920 herbaceous angiosperms which are 86.5% of the angiosperm species.

Of the 148 woody species 32 (21.6%) are alien and 116 (78.4%) are native whereas of the 948 herbaceous species 237 (25%) are alien and 711 (75%) are native. Three of the 4 (75%) gymnosperm species (which are all woody) are alien and one (3.6%) of the pteridophyte species (which are all herbaceous), *Marsilea* of the *Polypodiophyta*, is an alien. In the angiosperms 29 (20.1%) of the woody species are aliens and 115 (79.9%) are native and of the herbaceous species 236 (25.7%) are aliens and 684 (74.3%) are native.

The largest woody genera are *Quercus* (10 species); *Crataegus*, *Rubus*, *Salix* (8 species each); *Lonicera* (7 species) and *Acer*, *Carya*, *Prunus*, *Rosa* (5 species each). The largest herbaceous genera are the largest genera listed near the end of the taxonomic analysis section of this paper.

#### DURATION

Of the 1096 species 261 (23.8%) are annuals, 40 (3.7%) are biennials and 795 (72.5%) are perennials. There are no annual or biennial pteridophytes or gymnosperms. Of the perennial species one (0.1%) is a *Lycopodiophyta*, three (0.4%) are *Equisetophyta*, 24 (3.0%) are *Polypodiophyta*, four (0.5%) are *Pinophyta* and 763 (96.0%) are *Magnoliophyta*. Of the 1064 angiosperm species 261 (24.5%) are annuals, 40 (3.8%) are biennials, and 763 (71.7%) are perennials.

Of the 261 annual species 128 (49%) are aliens, of the 40 biennial species 23 (57.5%) are aliens and of the 795 perennial species 118 (14.8%) are alien. There are no alien *Lycopodiophyta* or *Equisetophyta*, in the *Polypodiophyta* the only alien is one out of 24 (4.2%) perennial species and in the *Pinophyta* three out of four (75%) perennial species. In the angiosperms 128 of the 261 (49%) annual species are aliens, 23 of the 40 (57.5%) biennial species and 114 of the 763 (14.9%) perennial species.

#### HABITAT

Of the 1096 species 61 (5.6%) are obligate aquatics and 1035 (94.4%) are terrestrial. There are no aquatic *Lycopodiophyta*, *Equisetophyta* or *Pinophyta*; one (1.6%) is a *Polypodiophyta* (*Marsilea*) and 60 (98.4%) are *Magnoliophyta*. Of the angiosperm species 60 (5.6%) are aquatic. Of the 61 aquatic species 4 (6.5%) are aliens and of the 1035 terrestrial species 265 (25.6%) are aliens. In the *Polypodiophyta* there is one aquatic species and it is an alien. In the angiosperms three (5%) of the 60 aquatic species are alien and 262 (26.1%) of the 1004 terrestrial species are aliens.

#### NATIVE SPECIES

Of the 1096 species of spontaneous vascular plants in McDonough County, 827 (75.5%) are native species. These include one (0.1%) *Lycopodiophyta*, three (0.4%) *Equisetophyta*, 23 (2.8%) *Polypodiophyta*, one (0.1%) *Pinophyta* and 799 (96.6%) *Magnoliophyta*. Of the 799 native species of the *Magnoliophyta* 230 (28.8%) are *Liliopsida* and 569 (71.2%) are *Magnoliopsida*. The 827 native species in McDonough County represent 42.1% of the native species in Illinois.

As a primary result of habitat destruction, principally due to man's activities (i.e. agricultural practices, transportation corridors, housing and urban development), the numbers of native species and plants have been reduced and without preservation and/or mitigation efforts this trend will continue. An indicator of this trend is that native species become rare, threatened, endangered and finally extinct. The Illinois Natural History Survey (1986) indicates 0-5 endangered or threatened species for McDonough County. Bowles, et al. (1981) lists 5 such species one being threatened and 4 endangered:

*Panax quinquefolius*: threatened; although indicated to not be presently known to be extant there are at least three extant locations.

*Beckmannia syzigachne*: endangered; although indicated to be extant based on collections in 1974, this author has been unable

to locate it at this location the past two years. Myers (1975) states that at this location (a railroad prairie) it is "probably a railroad migrant."

*Cypripedium reginae*: endangered; indicated to not being presently extant seems to be accurate since the last collection is recorded from 1881 per Sheviak (1974).

*Habenaria leucophaea*: endangered; indicated to not being presently extant seems to be accurate since the last collection is recorded from 1950 per Sheviak (1974).

*Thelypteris phegopteris*: endangered; indicated to not being presently extant seems accurate since no recent collections are known.

Recent collections in the County have resulted in the location of the following three species not in Bowles, et al. (1981) for McDonough County.

*Tradescantia bracteata*: endangered; two small colonies are extant but their location on private land intended for agriculture makes their future precarious. Bowles et al. (1981) states that no populations are presently known in Illinois.

*Hydrastis canadensis*: threatened; many plants are present in a preserve (Ferster Woods) owned by Western Illinois University.

(*Pinus resinosa*: endangered; a number of plants are present resulting from reproduction of plants planted in Argyle State Park about 1949. Although these are spontaneous plants they should be excluded from this list since they are not part of the original native vegetation.)

The seven threatened and endangered species represent 0.64% of the 1096 species recorded for McDonough County. Of these seven two (28.6% or 0.18% of all species) are threatened species and five (71.4% or 0.46% of all species) are endangered. All of the threatened species are *Magnoliophyta* whereas four (80%) of the endangered species are *Magnoliophyta* and one (20%) is a *Poly-podiophyta*. Of the 827 native species in the County, these seven are 0.85%, the two threatened species being 0.24% and the five endangered ones being 0.6% of the native species. Of the 799 angiosperm native species, two (0.25%) are threatened and four (0.5%) are endangered. Of the Illinois threatened and endangered species, seven (1.93%) are reported from McDonough County. However of these seven species, only three species *Panax quinquefolius* (threatened), *Hydrastis canadensis* (threatened) and *Tradescantia bracteata* (endangered) are known to be extant; these three species represent 42.9% of the seven reported threatened and endangered species in McDonough County, 0.83% of the endangered and threatened species in the Illinois flora, and 0.4% of the native McDonough County species.

Although there are no Illinois Nature Preserves in McDonough County, there are four areas that are on the Illinois Natural Areas Inventory which are Area #144--Good Hope Marsh, Area #145--Lake

Argyle Barren, Area #171--Daniels Marsh and Area #172 (Argyle Lake) Sphagnum Seep (Illinois Department of Conservation 1978). Henry (1985) has listed and very briefly given some of the species (including some uncommon ones) in 23 representative areas exemplifying some of the best examples of remnants of the original vegetation of the County including the four areas on the Natural Areas Inventory.

Principally per Mohlenbrock and Ladd's (1978) distribution maps of the Illinois vascular plant species the following McDonough County species are generally disjunctive from the indicated Illinois geographical range: *Acer rubrum* (S 1/3, NE), *Beckmannia syzigachne* (NE), *Carex caroliniana* (S 1/3), *C. flaccosperma* (S 1/3), *C. gracillima* (N 1/3), *C. laevivaginata* (S 1/3, NE 1/3), *Commelina virginica* (S 1/4), *Galium boreale* (N 1/3), *Gerardia pedicularis* var. *ambigens* (NE 1/4), *Jussiaea decurrens* (S 1/3), *Lechea pulchella* (N and E 1/3), *Liquidambar styraciflua* (S 1/3), *Lonicera dioica* (N 1/3), *Lycopodium flabelliforme* (N,E,S edge), *Polypodium vulgare* var. *virginianum* (N 1/3, S 1/3), *Ranunculus micranthus* (S 1/2) and *Specularia biflora* (S 1/4).

Myers and Henry (1976) listed native taxa they considered extinct, nearly extinct, rare or endangered in McDonough and Hancock counties based upon later floristic data compared to floristic data derived from Kibbe (1952). Sixteen percent (130 species) of the native species were considered extinct or nearly extinct and another 68 species rare or endangered. It was emphasized by Myers and Henry (1976 p. 35) that further collections might change the status of some of the plants which the following data is intended to do. The following list of species are those from Myers and Henry's (1976) list that at some time have been recorded for McDonough County. These species are listed in the same order as in Myers and Henry (1976) and are annotated with Mohlenbrock's (1975) synonym (if there is one) and in parenthesis the last date of collection (and comments if needed) which for a number of these species indicate a change in the status of their occurrence to uncommon.

*Athyrium angustum* = *A. felix-femina* var. *rubellum* (1983), *Dryopteris marginalis* (1984), *Pteridium latiusculum* = *P. aquilinum* var. *latiusculum* (1984; population decreasing), *Dianthera americana* = *Justicia americana* (1985), *Callitriche heterophylla* (not present in 1969 location in 1984 due to stream channelization), *Campanula aparinoides* (1983), *Silene nivea* (no new collections since 1968), *Stellaria longifolia* (1969), *Aster anomalus* (1984), *Aster sericeus* (1981), *Cirsium hillii* = *C. pumilum* (1986), *Dyssodia papposa* (1984) *Helenium nudiflorum* = *H. flexuosum* (exact collection date unknown but presumed to be between 1960 and 1978), *Verbesina helianthoides* (1983), *Convolvulus spithamaeus* = *Calystegia spithamaea* (1986), *Cuscuta glomerata* (1979; rare), *Arabis virginica* = *Sibara virginica* (1982), *Acalypha gracilens* (1979),

*Euphorbia obtusata* (1984), *Gentiana flavida* = *G. alba* (1982), *Carya laciniosa* (1969), *Agastache scrophulariaefolia* (1979; rare), *Teucrium occidentale* = *T. canadense* var. *occidentale* (1983), *Desmanthus illinoensis* (1979), *Lobelia cardinalis* (exact collection date unknown but presumed to be between 1954 and 1978), *Ludwigia palustris* = *L. palustris* var. *americana* (1983), *Caulophyllum thalictroides* (1983), *Phlox glaberrima* = *P. glaberrima* ssp. *interior* (1979), *Polygonum hydropiperoides* (1983), *Polygonum tenue* (no new collections since 1948), *Lysimachia quadriflora* (1979; rare), *Anemone cylindrica* (1984), *Hydrastis canadensis* (1983), *Ranunculus fascicularis* (1984), *Agrimonia rostellata* (exact collection date unknown but presumed to be between 1954 and 1978), *Crataegus calpodendron* (1983), *Crataegus punctata* (1967), *Gillenia stipulata* (1986), *Salix rigida* (1983), *Aureolaria pedicularia* = *Gerardia pedicularia* var. *ambigens* (exact collection date unknown but presumed to be between 1954 and 1978), *Chelone glabra* (1983), *Gerardia purpurea* (no new collections since 1950), *Gratiola neglecta* (1983), *Pedicularis lanceolata* (1983), *Verbena canadensis* (1983), *Vitis aestivalis* (1979; rare), *Tradescantia virginica* = *T. virginiana* (1983), *Carex albolutescens* (1979), *Carex artitecta* (no new collections since 1969), *Carex crinita* (1984), *Carex cruscovii* (1984), *Carex granularis* (1969), *Carex hirtifolia* (1983), *Carex jamesii* (1983), *Carex lacustris* (1983), *Carex muskingumensis* (1984), *Carex oligocarpa* (1979; rare), *Carex scoparia* (1984), *Carex trichocarpa* (1984), *Carex vesicaria* (no new collections since 1950), *Cyperus rivularis* (1983), *Eleocharis compressa* = *E. elliptica* var. *compressa* (1979), *Scleria triglomerata* (1984), *Agrostis perennans* (1984), *Brachyelytrum erectum* (1983), *Diarrhena americana* = *D. americana* var. *obovata* (no new collections since 1974), *Koeleria cristata* = *K. macrantha* (1979; rare), *Melica nitens* (1979), *Muhlenbergia racemosa* (1979), *Muhlenbergia sylvatica* (1979; rare), *Panicum leibergii* (1979; rare), *Panicum praecocius* (exact collection date unknown but presumed to be between 1954 and 1978), *Paspalum ciliatifolium* (1979; rare), *Phragmites communis* = *P. australis* (1984), *Poa palustris* (1979; rare), *Sporobolus vaginiflorus* (1979), *Stipa spartea* (1984), *Tripsacum dactyloides* (1984), *Juncus acuminatus* (1979; rare), *Allium tricoccum* (1983 var. *burdickii*), *Cypripedium reginae* (1881; perhaps extinct), *Habenaria leucophaea* (no new collections since 1950; perhaps extinct), *Spiranthes cernua* (1950; Sheviak (1974) as *S. magnicamporum*; Sheviak annotation label as *S. cernua* X *S. magnicamporum*-"low prairie race 3n"), *Spiranthes gracilis* = *S. lacera* (1983), and *Potamogeton diversifolius* (no new collections since 1951).

Myers (1972 p. 58) listed 19 species considered rare in Illinois that were reported for McDonough County. Four others similarly annotated (R) in his catalog are #56, *Dryopteris phegopteris* (= *Thelypteris*); #1387, *Galium tinctorium*; #1634, *Echinodorus rostratus* (= *E. berteroi* var. *lanceolatus*); and #1805, *Cyperus flavescens*. Some of these 23 species have been referred to and

commented on in other parts of this section of this paper. Collection data up to the present indicate that all of these species are uncommon and as noted before at least *Habenaria leucophaea* and *Dryopteris* (= *Thelypteris*) *phlegopteris* may be extinct. Myers (1972) catalog did not include any annotated McDonough County species as extinct (= X).

A closing comment on two species that are of interest is that *Lycopodium flabelliforme* first collected in 1976 (Henry and Scott 1978) has not be found since 1984. Perhaps it died due to a severe summer drought followed by severe winter cold in 1983. The thin soil where it was growing would dry out quickly. *Heracleum maximum* is uncommon being known at one location about two miles northeast of Colchester where there is a nice stand of it in the Lamoine River floodplain.

#### ALIEN SPECIES

Myers and Henry (1979) discussed the alien flora of an area consisting of both McDonough and Hancock counties; this paper concerns the current status of alien species in McDonough County only.

Of the 1096 spontaneous vascular plant species, 269 (24.5%) are alien and 827 (75.5%) native. These 269 alien species represent 35.5% of the alien species in the Illinois vascular flora. Of these 269 alien species there are none in the *Lycopodiophyta* or *Equisetophyta*, one (0.4%) in the *Polypodiophyta*, three (1.1%) in the *Pinophyta* and 265 (98.5%) in the *Magnoliophyta* of which 209 (78.9%) are *Magnoliopsida* and 56 (21.1%) *Liliopsida*. Fifty-six (20.8%) of the County alien species are *Liliopsida* and 209 (77.7%) are *Magnoliopsida*. Of the 1096 species one (0.1%) in an alien *Polypodiophyta*, three (0.3%) are alien *Pinophyta* and 265 (24.2%) alien *Magnoliophyta* (56 (5.1%) *Liliopsida* and 209 (19.1%) *Magnoliopsida*). One (4.2%) of the *Polypodiophyta*, three (75%) of the *Pinophyta* and 265 (24.9%) of the *Magnoliophyta* species are aliens. Of the dicot species 209 (26.9%) are alien whereas 56 (19.6%) of the monocot species are aliens. The 56 monocot alien species represent 5.3% of the 1064 angiosperm species whereas the 209 dicot alien species represent 19.6%.

At least 90% of the land area of McDonough County is occupied by alien species, principally as crops and pasture, indicating their economic importance. Many aliens are well adapted to and occur County-wide in disturbed soil areas (disturbophytes) where they may or may not be considered weeds depending on their perception and use by varying people. Of the 269 alien species four (1.5%) are obligate aquatic and 265 (98.5%) are terrestrial. Out of the four aquatic alien species one (25%) is a *Polypodiophyta* and three

(75%) are *Magnoliophyta*. In the divisions that have alien species 100% of the *Polypodiophyta* alien species are aquatic, 100% of the *Pinophyta* are terrestrial and three (1.1%) of the *Magnoliophyta* alien species are aquatic and (98.9%) are terrestrial.

Of the 269 alien species 221 (82.2%) had their origin from the old world, 17 (6.3%) from the tropics, and 31 (11.5%) from other parts of the United States (three (9.7%) from east and north U.S., two (6.4%) from southern U.S. and 26 (83.9%) from western U.S.). The one *Polypodiophyta* alien species came from the old world, the three *Pinophyta* from the United States (two (67%) from east/northern U.S., one (33%) from southern U.S.) and of the 265 *Magnoliophyta* alien species 220 (83%) are of old world origin, 17 (6.4%) from the tropics and 28 (10.6%) from other parts of the United States (one (36%) from east/northern U.S., one (3.6%) from southern U.S., 26 (92.8%) from western U.S.).

Of the 269 alien species 159 (59.1%) are or once were cultivated. Out of these 159 species one (0.6%) is a *Polypodiophyta*, three (1.9%) are *Pinophyta* and 155 (97.5%) *Magnoliophyta*. In the divisions that have alien species one (100%) of the *Polypodiophyta*, three (100%) of the *Pinophyta* and 155 (58.5%) of the *Magnoliophyta* alien species are or once were cultivated.

Of the 269 alien species 128 (47.6%) are annuals, 23 (8.5%) are biennials and 118 (43.9%) are perennials. All (100%) of the annuals and biennials are *Magnoliophyta* and of the perennials one (0.9%) is a *Polypodiophyta*, three (2.5%) are *Pinophyta* and 114 (96.6%) are *Magnoliophyta*. In the divisions that have alien species one (100%) of the *Polypodiophyta*, three (100%) of the *Pinophyta* and 114 (43%) of the *Magnoliophyta* alien species are perennials. The 128 annuals and 23 biennials constitute respectively 48.3% and 8.7% of the *Magnoliophyta* alien species.

Of the 269 alien species 32 (11.9%) are woody. Out of these 32 species three (9.4%) are *Pinophyta* and 29 (90.6%) are *Magnoliophyta*. In the divisions that have alien species three (100%) of the *Pinophyta* and 29 (10.9%) of the *Magnoliophyta* alien species are woody.

Of the 269 alien species 123 (45.7%) are weeds. Two (1.6%) of these weed species are *Pinophyta* and 121 (98.4%) of them are *Magnoliophyta*. In divisions that have alien species there are no weeds in the *Polypodiophyta*, two (67%) of the three *Pinophyta* alien species are weeds and in the *Magnoliophyta* 121 (45.7%) of the 265 alien species are weeds. For further information see Henry (1983a) for a list of the weeds of the spontaneous McDonough County vascular plant flora in which the alien weed species were annotated. In a later paper Henry (1983b) analyzed this weed flora including the alien species.

Comparing the data from Myers' 1948 checklist of McDonough County vascular plants (which is reproduced as Myers (1983)) with his annotated 1972 list (Myers 1972) and with this analysis it is clear that the alien species component of this flora is increasing. At the time of settlement it is presumed that the flora was 100% native species and 0% aliens. Myers listed 522 species for 1948 but with modifying it due to misidentifications, synonymyms, omitting infraspecific taxa and hybrids, specimens not verified as being in the County or out of range, the adjusted number is 502 species. Of these 502 species 90 (17.9%) are aliens and 412 (82.1%) native. By 1972 out of 944 species 192 (20.3%) were alien (Myers (1972 p. 59) stated 17.4% out of 919 species but this figure excluded the 22 (25 I counted as excluded as indicated by being unnumbered) unnaturalized alien species) and 752 (79.7%) were native and in 1986 (this paper) out of 1096 species 269 (24.5%) were aliens and 827 (75.5%) were native. Regarding the percent increase in the proportion of these alien species in this flora, it is still true that the alien flora is changing more rapidly than the native flora (as noted for McDonough and Hancock counties (and Europe) in 1979 (Myers and Henry 1979)) since the percent the alien species have increased from 1948-1986 is 6.6% resulting in an equivalent decrease in the percent of the total species today that are native species of which some are becoming rare, threatened, endangered and extinct as commented on earlier in this paper. Over the 24 years between 1948-1972 the addition of 102 alien species represented a per year introduction of 4.25 per year; between 1972-1986 (77 additional species during 14 years) were 5.5 per year and between 1948-1986 (179 species over 38 years) the yearly introduction of alien species averaged 4.7 per year.

It would be useful to have exact data on the time and rate of the naturalization of alien species but this is made difficult by lack of a uniformly agreed upon definition of what constitutes naturalization and how to ascertain it (particularly initially) with certainty in the field. Therefore such decision of naturalization are necessarily somewhat arbitrary and subject to personal interpretations and observations of field, herbarium and published data. Certainly the naturalization process occurs over varying time periods for varying species as influenced by the environmental conditions surrounding the various plants of the species.

Myers in his 1948 list made no annotations regarding naturalized aliens but in his 1972 annotated list indicated that over 160 (my adjusted count is 159) were naturalized (by giving the species numbers in his catalog) which would be 83.3% of the 192 recorded alien species. These 192 species, as previously stated, represent 20.3% of the 944 County spontaneous species while the 160 naturalized species represent 16.9% of the County spontaneous species. Using Myers naturalization criteria (Myers 1972 p. 9),

comments on some of the species by Reese (1979) and my observations/interpretations it is estimated that probably 60 alien species (including eight of the 22 (my count is 25) species that Myers (1972) considered unnaturalized (i.e. were not numbered) have become naturalized between 1972 and 1986. Adding these 60 to Myers' 160 makes 220 (81.8%) probable naturalized alien species out of the present 269 alien species in the flora. These 269 species, as previously noted, represent 24.5% of the County spontaneous species while the 220 naturalized species represent 20.1% of the County spontaneous species. [For comparison with the spontaneous vascular flora of Illinois, Myers (1972) data show that in 1972 all aliens composed 25.3% and naturalized aliens 13.6% of the Illinois species and also that 53.6% of the alien species were naturalized. By 1986 Pruka's (1986 p. 3) 811 naturalized non-native species represent 28.4% of the 2853 total species in Mohlenbrock (1986) and 26.2% of the 3100 species mentioned by the Illinois Natural History Survey (1986). Since the Illinois Natural History Survey (1986) reports that approximately 28% of the state's flora is not native then comparison with Pruka's data would indicate that 93 to 100% of the state's aliens are now naturalized. The indication that about 43% of the Illinois alien species became naturalized in the last 14 years (54% by 1972 and averaging 97% by 1986) seems to be an astonishing recent rate of naturalization considering the first alien species were apparently collected in Illinois by Michaux in 1795 (Henry and Scott 1980).<sup>7</sup> The 220 naturalized alien species in McDonough County would represent 27.1% of the 811 (Pruka 1986 p. 3) naturalized aliens in Illinois. It is tempting to indicate the rate of naturalization in McDonough County by stating that of the 77 species collected during the 14 years from 1972-1986 fifty-two (67.5%) became naturalized, in addition to the eight non-naturalized species that Myers listed in 1972 as unnaturalized, indicating 4.3 species naturalized per year (60 divided by 14); however this could be misleading since some (or all) of the 52 species could have already been naturalized when (before) collected meaning the exact time of naturalization could not be precisely determined. Of course, the naturalization status of any alien species is subject to change with the availability of additional data. Myers (1972 pp. 6-9) discusses the role of aliens in floras.

Some of the most recently rapidly spreading aliens in the County are *Dipsacus laciniatus*, *Coronilla varia*, *Elaeagnus umbellata*, *Lonicera* spp., *Rosa multiflora*, *Sonchus arvensis* var. *glabrescens*, *Maclura pomifera*, *Morus alba*, *Populus alba*, *Ulmus pumila*, *Berberis thunbergii* and *Ligustrum vulgare*. Perhaps soon to be more troublesome are *Euomyzus alatus*, *Lythrum salicaria*, *Najas minor*, *Potamogeton crispus*, *Cirsium arvense* and *Chrysanthemum leucanthemum*. Henry (1983c) judged *Marsilea quadrifolia* to not be a serious weed in the Lamoine River system under present conditions; recent

observations have shown that it is decreasing since in 1986 there was none immediately below the Spring Lake dam or in the adjacent part of Spring Creek. Perhaps the noticeably higher water level in the creek caused by a beaver dam about 0.3 mile below the dam is responsible for this change which may or may not be only temporary. The original presence of *Marsilea* in the northern end of the lake has been practically totally reduced (perhaps due to the higher water level caused by the new dam) and now the only major population is at the south end of the lake east of the dam. *Taxodium distichum*, *Pinus resinosa* and *P. strobus* planted in 1948-1949 have apparently just in the last several years started to reproduce (Henry and Scott 1986).

As yet, no genetically (bio-) engineered vascular plant species have been introduced directly (i.e. purposefully) or indirectly (accidentally) into the County flora. Such plants (species) since not of a native genotype are, of course, aliens and should be treated as such. Like any other aliens they could escape, become spontaneous and finally naturalized thus further threatening the well being and distribution of the native flora and ecosystem.

The potential for alien species to become established and naturalized is not static but can vary with time and environmental conditions. Regardless of a species being judged as having a low, medium or high potential for spreading or naturalization at a given time, at least some of any potential is realized once they do escape. The ultimate potential in most if not all cases is unknown. Therefore the escape and naturalization potential of alien species is unpredictable, variable and irregular. Until we are able to predict with certainty the full consequences (both direct and indirect) of an alien's (including genetically engineered plant species) release into an ecosystem (particularly on the disruption and displacement of the native flora) perhaps native rather than alien species should be recommended for use. If aliens are not used then there can be no problems, mistakes, miscalculations or misgivings concerning their use or take-over of native ecological processes and functions. (Native plants, however, can become problems also as evidenced by the fact that 60% of the McDonough County weed species are native species.) I often fear for the future integrity of the native flora as the increase of alien species continues.

#### WEEDS

Of the 1096 species, 310 (28.3%) are weeds. Of these weed species none are *Lycopodiophyta*, three (1.0%) are *Equisetophyta*, one (0.3%) is a *Polypodiophyta*, three (1.0%) *Pinophyta* and 303 (97.7%) *Magnoliophyta*. All 3 species (100%) of the *Equisetophyta* are weeds as is one (4.2%) of the 24 species of *Polypodiophyta*, three (75%) out of 4 species of *Pinophyta* and 303 (28.5%) of the 1064 *Magnoliophyta*

species. Of the 310 weed species 123 (39.7%) are alien. None of the *Equisetophyta* or *Polypodiophyta* weed species are aliens. Two (67%) out of the three *Pinophyta* weed species are aliens as are 12 (39.9%) of the 303 angiosperm weed species. Henry (1983a) presented a list of the weeds (annotated for aliens) of the spontaneous McDonough County vascular plant flora and in a later paper (Henry 1983b) analyzed this weed flora; this later paper should be consulted for a more detailed analysis of this weed flora. As more marginal and forested areas become subjected to cultivation (often intensive) all weeds, particularly woody species, would be expected to increase as data in Henry (1983b) indicate.

#### POISONOUS SPECIES

1. To Humans--Of the 1096 species 197 (18%) are poisonous to humans. None of these 197 species are *Lycopodiophyta*, *Equisetophyta* or *Polypodiophyta*; one (0.5%) is a *Pinophyta* and 196 (99.5%) are *Magnoliophyta*. One (25%) of the four *Pinophyta* species are poisonous to humans as are 196 (18.4%) of the 1064 *Magnoliophyta* species. Plant species poisonous to humans were determined from Hardin and Arena (1974) and Lampe and McCann (1985).

2. To Livestock--Of the 1096 species 60 (5.5%) are poisonous to livestock. None of these 60 species are *Lycopodiophyta* or *Pinophyta*; three (5.0%) are *Equisetophyta*, one (1.7%) *Polypodiophyta* and 56 (93.3%) are *Magnoliophyta*. Three (100%) of the *Equisetophyta*, one (4.2%) of the 24 species of *Polypodiophyta* and 56 (5.3%) of the 1064 *Magnoliophyta* species are poisonous to livestock. Plant species poisonous to livestock were determined from Evers and Link (1972).

#### DRUG SPECIES

Of the 1096 species 178 (16.2%) were on Tehon's (1951) list of Illinois drug plants the source of the plant drug species used in this analysis. None of the 178 species are *Lycopodiophyta*, one (0.6%) is an *Equisetophyta*, two (1.1%) are *Polypodiophyta*, two (1.1%) are *Pinophyta* and 173 (97.2%) are *Magnoliophyta*. One (33.3%) of the three *Equisetophyta* species are drug plants as are two (8.3%) of the 24 *Polypodiophyta* species, two (50%) of the four *Pinophyta* and 173 (16.3%) of the 1064 *Magnoliophyta* species.

#### SUMMARY

1. Dr. R. M. Myers, for whom the Western Illinois University Herbarium (MWI) is named, initiated floristic studies of McDonough County vascular plants in 1945 and continued through

1977.

2. Presently there are 1096 species of plants in the County's spontaneous vascular flora which represents about 40% of the species in the Illinois spontaneous vascular flora. In addition, there are 48 infraspecific taxa and seven hybrids.  
  
Twenty-four percent of the species are alien and 76% native. Of the native species two are threatened and five endangered in Illinois and of these seven species only three are known to be extant. There are four areas on the Illinois Natural Areas Inventory and no Illinois Nature Preserves in the County.
3. The 1096 species occur in five divisions most (97.1%) being *Magnoliophyta* of which 73% are dicotyledons. Pteridophytes compose 2.6% and gymnosperms 0.3% of the species. These species occur in 114 families (*Compositae* being the largest) and 477 genera (*Carex* the largest).
4. Woody species compose 13.5% and herbaceous species 86.5% of the species. Fifty-five percent of the woody species are trees, 36% shrubs and 9% vines. Thirty-two percent of the woody species and 25% of the herbaceous ones are alien. The largest woody genus is *Quercus* and the largest herbaceous is *Carex*.
5. Of the 1096 species, 24% are annuals, 4% biennials and 72% perennials. Forty-nine percent of the annuals, 58% of the biennials and 15% of the perennials are aliens.
6. About 6% of the species are obligate aquatics and 94% terrestrial. Nearly 7% of the aquatic species and 26% of the terrestrial ones are alien.
7. The 269 alien species represent 36% of the alien species in Illinois and occupy at least 90% of the County's land area primarily as crops and pasture. Most of the alien species had their origin from the old world (82%), 6% from the tropics and 12% from other parts of the United States (mostly from western U.S.). Fifty-nine percent of the alien species have been cultivated. The alien species are about 2% obligate aquatics, 48% annuals, 8% biennials, 44% perennials, 12% woody and 46% weeds. Since 1948 the introduction of alien species averages 4.7 per year. It is estimated that probably about 82% of the alien species are naturalized. As yet, no alien species of genetically-engineered origin have been introduced.
8. Of the 1096 species 28% are weeds of which about 40% of the weed species are alien.

9. Eighteen percent of the 1096 species are poisonous to humans, about 6% poisonous to livestock and 16% are on the list of drug plants of Illinois.

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